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GLUCOSE LEVEL CHANGES IN PATIENTS WITH DIABETES MELLITUS AND IN HEALTHY INDIVIDUALS UNDER THE INFLUENCE OF LOW-LEVEL LASER THERAPY

T. Navitskaya, V. Lemiasheuski

*Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
tatiananovitskaya1108@mail.ru*

This research is devoted to the study of changes in glucose levels in patients with diabetes mellitus and in healthy individuals under the influence of low-level laser therapy (LLLТ). It is shown that LLLТ is an important component of therapy in the treatment of type 2 diabetes, since it favorably affects the biochemical parameters of blood and increases the resistance of the organism to unfavorable factors.

Keywords: diabetes mellitus, hyperglycemia, low-level laser therapy.

Type 2 diabetes mellitus (DM) is a chronic metabolic disorder in which prevalence has been increasing steadily all over the world. Diabetes is characterized by a chronic hyperglycemic condition resulting from insufficient action of insulin [1]. The main complications of this disease are damage to kidney, blood vessels and eyesight, nervous system disturbance. Abovementioned complications may lead to disability, therefore the search for new ways of treatment and reduction of complications threat level are relevant objectives at the moment. In this regard the top-priority is the choice of treatment which has a many-sided effect on the human body. One of these methods is the low-level laser therapy (LLLТ).

Low intensity laser therapy is referred to electromagnetic radiation of optical range. The helium-neon laser radiation has a low radiant power – up to 20 mW with a wavelength equal to 630 nm capable of affecting trigger mechanisms of cellular regulation, changing cell membrane condition by the increase of cell functional activity, changing of metabolic processes, stimulating of microcirculation and oxidation-reduction processes, as well as increasing the human body tolerance. At the same time laser radiation has not so many contraindications, which include eidosyncrasy, febricity, presence of benign or malignant tumors.

Currently there is no consensus on laser impact on the human body, its separate systems and abnormal focus. It is assumed that the variability and systematic nature of secondary biochemical and physiological effects of LLLТ on blood is explained by the variety of photoacceptors and primary photobiological reactions implemented on different levels. Laser interaction with a biological object includes the following stages: light quantum absorption and intramolecular energy redistribution (photophysical processes), an intermolecular energy transfer and primary photochemical reactions, biochemical processes involving photoproducts, secondary photobiological reactions and the body's general physiological response to the effect of light [2].

To study the effect of LLLТ on blood glucose values, 32 patients were included in this study. Group I included the patients who didn't have type 2 diabetes – 16 people (50 %) of the average age of $50,18 \pm 8,4$ years. The second group consisted of patients with type 2 diabetes of the average age of $56,87 \pm 6,83$ years. Serum samples of venous blood were analyzed before and after the effects of LLLТ in healthy individuals and in patients with type 2 diabetes.

Statistical analysis was performed using the R programming language and Microsoft Excel table processor. Varying quantitative indicators of the results of the studies were subjected to statistical treatment, with an assessment of the reliability of the effects using Student's t-test. The difference was considered to be reliable for $p \leq 0,05$ [3].

In patients with type 2 diabetes after LLLТ use, the blood glucose level was reliably reduced ($p = 0,028$), the baseline level was $7,715 \pm 2,23$, the post-procedure glucose level was $6,78 \pm 1,39$. Accordingly, in healthy patients such differences in the level of glucose before and after the effects of LLLТ was not observed and corresponded to the value ($p = 0,76$). Thus, one can draw a conclusion about the favorable effect of the procedure on the body of patients with type 2 diabetes.

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THE STATE OF HEALTH OF PREGNANT WOMEN AND THE PECULIARITIES OF PREGNANCY AND BIRTH

A. Nosareva, M. Sinelyova

*Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
Sinelyova@bsu.by*

The analysis of the statistical data of the health institution “Mogilev polyclinic №11” on state of health of pregnant women in 2016 showed that most frequent case of pregnancy complications is the threat of pregnancy termination which forms 20,2 %, less frequent are the cases of infectious and parasitic diseases – 17,4 % and infections of the urogenital system – 15,8 %.

Keywords: reproductive health, caesarean section, teenage pregnancy, premature birth.

The main tasks of modern perinatal obstetrics are the creation of the best possible conditions for the woman performing the functions of motherhood, the maintenance of her health and ensuring the birth of healthy children. High somatic incidence among pregnant women, an increase in the age of women, the expansion of the criteria for childbearing and burdened reproductive history increase the probability of complications during pregnancy, pathological births and a complicated post-natal period. A high incidence among pregnant women also determines a higher level of pregnancy complications that requires obstetric in-patient treatment.

Early medical check-up in antenatal clinic, consultations from all specialists make it possible to diagnose all existing diseases and to conduct timely diagnostic and treatment activities.

In this study, data on pregnant women’s state of health was obtained in the antenatal clinic of the health institution “Mogilev polyclinic №11”. The analysis of statistical reports, as well as of pregnant women’s and postpartum women’s medical records for 2012–2016 was carried out.

Based on the analysis being carried out, it was found that the births on time constituted 90,1 % in 2015 and 92,0 % in 2016. In 2016, the number of undeveloped pregnancies decreased by 2,2 % and that of late spontaneous abortions – by 0,5 %. The ratio of preterm birth to urgent for 2015 and 2016 was 1/30,0 and 1/16,7, respectively. It is shown that from 2012 to 2016 the number of premature births and cesarean sections increased. Teenage pregnancy constituted 1,2 % in 2016, and all teenage pregnancies ended in childbirth.

Compared with 2012–2015, the number of teen pregnancies declined in 2016. When comparing the data on the Republic of Belarus and the health institution “Mogilev polyclinic №11” for 2015, it was found that among the diseases complicating the course of pregnancy, the most frequent were the urinary tract infections with the corresponding rate of 26,2 % and 10,4 %, less frequent - pregnancy anemia – 22,4 % and 9,2 %, respectively.

SPECIFIC FEATURES OF THE PSYCHOLOGICAL STATE OF CHILDREN LIVING IN THE REGIONS CONTAMINATED WITH RADIONUCLIDES

A. Opanasenko, E. Tolstaya

*Belarusian State University, ISEI BSU,
Minsk, Republic of Belarus
n.opanasenko27@gmail.com*

The analysis of the archival data of the Scientific and Research Clinical Institute of Radiation Medicine and Endocrinology on the psychological status of children living on radionuclide contaminated territories showed that